



DataInformed

Making big data and analytics work in the enterprise

Data-Driven Organizations and Marketing Analytics

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Every executive and manager turns to data, at some point, to learn about how business operations are performing. But in data-driven, or evidence-based, organizations, leaders and front-line employees alike use data and analytics not just to track performance, but to influence it systematically.

Guide to Leading Data-Driven Organizations

By Elana Varon

March 22, 2013

Every executive and manager turns to data, at some point, to learn about how business operations are performing. But in data-driven, or evidence-based, organizations, leaders and front-line employees alike use data and analytics not just to track performance, but to influence it systematically.

“Organizations that can make decisions [based on] concrete information and facts have a leg up on their competition, because they can act with greater precision and timeliness,” says Randy Bean, managing partner of consultancy New Vantage Partners and a former chief marketing officer.

But a data-driven business doesn’t come from ordering a bunch of new reports, or buying the latest technology tools. You have to change your decision-making culture, rethink your org chart and teach employees how to use data more effectively.

Deciding Where to Start

Business complexity often drives the need for evidence-based decision making, says Barbara Wixom, associate professor with the University of Virginia’s McIntire School of Commerce. Your customer base may be so diverse, or your supply chain so vast, that “your intuition doesn’t work anymore,” to understand what is happening on the ground, she says.

But it takes time to develop the capability—both analytically and technologically, that you need to exploit your data. “The most successful initiatives come out of C-level executives identifying the four or five most critical business questions they need to answer,” says Bean. From there, business leaders can home in on the data they have, the data they need and the tools they want to deploy in order to use it.

“One of my core responsibilities is to understand how my organization is trying to improve itself in the short term, medium term and the long term, so I can understand how to organize our analytics capabilities,” says Joe Kimura the medical director for analytics and reporting systems at Atrius Health, a collection of six medical groups serving 1 million patients in Massachusetts.

Creating a Data-Focused Culture

In a data-driven organization, people use data in their everyday work because doing so is aligned with achieving individual and business performance goals. But business leaders have to define the goals and the metrics that will be used to measure them.

For example, teachers who have data not only about their own students' grades but also about the factors affecting performance among thousands of students can do a better job choosing how to teach individual kids, observes Dan Domagala, CIO with the Colorado Department of Education. Teachers are held accountable for how their students improve based on state-level standards.

At Norfolk Southern Railway, corporate leaders decided to give yard managers bonuses for aligning the schedules of trains in their yards to overall targets the company had for on-time deliveries, says Wixom, who studied the company. Data helped them understand how their decisions would affect deliveries across the country.

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– Randy Bean, New Vantage Partners

As with any initiative designed to change how work is done, top leaders need to promote examples of when using data contributes to the results they want and offer ways for other teams within the organization to adopt successful practices. "They can spread like wildfire," says Domagala. "A school principal might say a teacher is doing something innovative, and that a couple of other teachers have tried it in the social studies class, and that can lead to a revolution from the ground up," spreading across the school district or even to multiple districts.

Changing How Data Is Managed and Delivered

Traditionally, IT has controlled data analysis and maintained the corporate databases. Meanwhile, the process for making data available has often been labor intensive and the tools used to analyze it hard to learn. As a result, many companies—even those with business-savvy analysts—have a gap to close between the data consumers who know what they want to ask and the technical experts who know where the data is and how to access it.

To bring the two sides together, some companies, including Atrius, have created integrated analytics teams—sometimes called centers of excellence—where business experts, data analysts and technologists from across the organization can collaborate more easily. Integrated teams can establish corporate data standards, enforce rules for data governance and develop tools that are appropriate for different levels of end users to share across the enterprise.

Because new technologies for managing and analyzing “big data” don’t require all data to be structured the same way, you can spend less time preparing it and more time querying it, says Bean. “The most forward looking companies are creating data discovery environments where they can take whatever data is at hand and conduct test-and-learn types of activities, rather than having to do up-front data definition and engineering.”

Evaluating the Need for an In-House Data Scientist

An analytics group or business unit, especially within a large company, may have a researcher with extensive business knowledge, technology expertise and deep experience with statistical modeling. It’s becoming popular to call such researchers data scientists—and lament how few people today have the right combination of skills.

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But not every organization needs a data scientist. “Most major companies had Ph.D. statisticians and others who were facile at manipulating data,” says Bean. “But they had their jobs eliminated in 2008-2009 because they weren’t integrated into mainstream business processes.”

Whether you need to hire, or cultivate data scientists on your team depends on how deep your research needs to be, observes Wixom. For instance, you do if you sell analytics-based products or services like ComScore, she adds. Or if you need to develop innovative research methods in order to understand your data.

But unless you have extensive requirements for advanced analytics, it might make the most sense to outsource the capability. “We work with industry partners to help us at very strategic spots,” says Kimura. “I’m not sure at what point it will make sense for an organization like ours to build that core competency in house.”

Teaching Data Consumers How to Use Information

Front-line employees probably won’t be crunching the data as the data scientists, business analysts or statisticians do. For them, “the data has to be easy to use,” says Colorado’s Domagala. “It has to be intuitive.”

“The tools we build in-house are trying to build in business logic so it doesn’t trip up our users as much as some of the more raw information,” says Kimura.


However, those front-line managers and employees, whether they're teachers, physicians or train dispatchers, still need to learn how use new tools as well as how to think about data so they ask the right questions, and can figure out what the answers mean.

UPS, for example, has committed to training its managers and front-line workers to use the findings of analytics to make better business decisions. Employees get training tailored to their roles, so that a driver, for example, can test her knowledge of the most efficient route against what the company's optimized navigation system suggests. The company combines its lessons on data interpretation with insights on how decisions influence business results.

Opportunities for analytics training, meanwhile, are growing at the university level. A recent survey of more than 300 professors by Wixom, Thilini Ariyachandra, associate professor of MIS at Xavier University, and John Mooney, associate professor of IS and Technology Management at Pepperdine University found that 41 percent of universities were offering more business intelligence and analytics courses in 2012 than they had two years earlier.

More than half of the respondents (55 percent), said their BI and business analytics classes, were designed to prepare students to be "data-savvy business people."

In addition to formal training in technology or statistical methods, workers need "ongoing coaching," says Wixom, "because processes will change and the context might change. This is where managerial experience comes in."

Data should inform people's decisions, not crush their instincts. "You use data to make sure you're going in the right direction," notes Kimura. "Instinct also tells you at times that the data is not always right." 

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When consumers make a purchase, ring a call center, visit a website, click a banner ad, comment on social networks, or join a loyalty program, they're producing valuable data—data that savvy marketers can analyze to make better business decisions.

Guide to Marketing Analytics

By Mindy Charski

February 8, 2013

When consumers make a purchase, turn on a cellphone, ring a call center, visit a website, click a banner ad, comment on social networks, or join a loyalty program, they're producing valuable nuggets of data that savvy marketers can leverage to make better business decisions.

They can do this through marketing analytics, which uses software-based algorithms and statistics to derive meaning. The ability to glean actionable insights from increasingly large datasets is a boon for a discipline that, while becoming more data driven over the past 50 years, has tilted more toward art than science.

"There's always been measurement in marketing," says Dave Fitzpatrick, director of marketing analytics at the New York consultancy Rise Analytics. "But now with the amount of data that we collect and analyze, we finally have the capabilities to thoroughly utilize that data better so the science aspect is becoming more important."

Taking a data-driven approach to marketing can benefit the bottom line, but let's be clear: Many marketers are not yet enjoying its bounty. The challenges come through in the findings of a 2012 study by the New York American Marketing Association (NYAMA) and Columbia University researchers: Almost two of five (39 percent) of senior corporate marketers said their own company's data is collected too infrequently or not real-time enough. About half (51 percent) said that a lack of sharing customer data within their own organization is a barrier to effectively measuring their marketing return on investment. And 65 percent said comparing the effectiveness of marketing across different digital media is "a major challenge" for their business.

Still, 91 percent of the 253 marketers interviewed said they believe successful brands use customer data to drive marketing decisions. So while there are clear challenges, there's also strong potential. And indeed, companies that are already using newer tools and technologies to store, integrate and analyze data are seeing the benefits of being able to more smartly target customers and prioritize spend.

Marketing Analytics Use Cases

Analytics can help marketers better understand their customer base and how well their efforts are performing—intelligence they can use to more smartly communicate to targeted market segments and allocate resources, such as deciding in which channels and how to spend advertising budgets. Brands must no longer market to every customer or prospect the same way. Instead, they can speak to individuals in a more relevant and personalized manner with customized offers that can drive sales, build loyalty, and differentiate a brand in a crowded marketplace.

“It really takes that marketing piece away from, ‘Hey it’s time to buy a product ’ and more of ‘Let’s remind you about **how great an experience you had** and let that experience really drive your motivation to buy the product.”

– Darren Jacoby, director of customer relationship marketing, Vail Resorts

For instance, to spur season pass holders to renew, the mountain resort company Vail Resorts sends direct mail that references information from the recipient’s previous ski season, including days and vertical feet skied. This data is generated by radio frequency (RF) technology on passes and lifts and is accessible to skiers through EpicMix, the company’s online and mobile application that connects with Facebook and Twitter.

“It really takes that marketing piece away from, ‘Hey it’s time to buy a product ’ and more of ‘Let’s remind you about how great an experience you had and let that experience really drive your motivation to buy the product,’” such as a season pass, says Darren Jacoby, Vail Resorts’ director, customer relationship marketing.

Marketers can also employ analytics to reveal patterns that would otherwise be hard to detect, like the one AgilOne, a cloud-based marketing analytics service, discovered for the online pet products retailer PetCareRx. After detecting a significant drop in its client’s average order value, AgilOne’s software was able to uncover a new group of customers who were buying recently introduced food products. These items have lower prices, yet this group of consumers was purchasing pet food more frequently.

“What marketing analytics was able to do is present PetCareRx with an opportunity to say, ‘You are now acquiring a new set of customers who behave differently, who are interested in different products, and figure out what you want to do about it,’” says Omer Artun, CEO of AgilOne in Mountain View, Calif.

Marketers are also turning to analytics to try to solve one of their trickiest puzzles—which marketing channels are providing the greatest return on investment. “That’s where big data comes in,” says Anil Kaul, CEO of the analytics and research firm AbsolutData in Alameda, Calif. “You need technology that brings all the data from various channels together and you’re able to build analytics that can measure the relative impact of all the different touch points you have with your customers.”

Constant Contact is among the organizations employing channel analytics to understand how new customers learn about the marketing solutions company, which uses media channels like online display, paid search and radio. But analyzing the data generated by the 35 billion emails that flow through its system annually also enables Constant Contact to offer insight to customers—many of whom are small businesses—like how to get targets to see and respond to their email messages, says Jesse Harriott, chief analytics officer at Constant Contact and co-author, with Jean-Paul Isson, of *Win With Advanced Business Analytics: Creating Business Value From Your Data*.

Database Marketing in the Days of ‘Mad Men’

Paul Berger, director of Bentley University’s Master of Science in Marketing Analytics program, traces the roots of marketing analytics to the 1960s with the early versions of database marketing. Two decades later, he says, bigger changes emerged: It became economically feasible to send more personalized documents—addressing recipients by name in letters, not just mailing labels, for instance; marketers became better at attributing sales to specific promotions; and companies began to focus on building the customer relationship, rather than just making the sale.

Organizations would increasingly recognize the value of transactional and demographic data, which fed into early customer relationship management (CRM) systems in the 1990s. Yet, the fragmented way many stored their structured data would ultimately restrict success in a landscape altered by the growth of online media in the 2000s and more recently, mobile media.

Many marketers found multichannel campaigns, like those that mix television and social media were even tougher to measure than single channel efforts. They also had difficulty gaining a full view of customers’ behavior across channels and predicting what those customers would do next. The situation would become even more complicated for marketers seeking to add to the mix information that didn’t fit neatly in databases, like social media mentions and call center transcripts.

Technical Advances Make Analytics More Accessible

Technological advances are making storage, integration and analysis of large datasets easier, faster and cheaper. Today open source tools like Hadoop and R that can run on commodity hardware allow users to cost effectively explore disparate types of data without first having to put them in a consistent format, for instance. “The technology and the tools are catching up to the desire of the people doing the work,” Harriott says.

The innovations translate into more opportunities for business users to search for gems. “You can go back and ask more interesting questions that you really couldn’t do before because you frankly can store almost everything that comes through your business,” Harriott says.

Meanwhile, it’s becoming easier for marketers to utilize predictive analytics, which uses statistical functions to evaluate one or more datasets to predict trends or future events. Tools to handle predictive analytics have been around for about 20 years, Harriott says, but they require technical expertise like a statistics background.

“What the industry’s looking for are those nontechnical tools that make it easy to do predictive analytics,” he says. “That’s where the industry hasn’t met its promise yet so to speak and there are a host of companies trying to solve that problem now.”

Starting Out

Expect to walk, not run, into marketing analytics. Here are six initial steps worth taking:

Get focused: Identify which questions you want to explore. For instance: How often should I send promotions to my high-value targets? Which of my customers are mostly likely to leave? And which offers are most profitable? Then evaluate whether your current tools can produce the answers. If not, consider the trade-offs of building in-house capabilities versus working with consultants or identifying vendors with expertise in the field.

Estimate the costs and benefits: Richard Smith, chief marketing officer of AIG Bank told a CMO Council webcast audience in December 2012 he recommends starting with a break-even analysis. After figuring out your costs, he says, project out what kind of improvement you’d need in your performance to justify the expense of improving your analytics. “Give it the reasonableness test—is that achievable?” he says. “Is it reasonable to think the investment is going to lead to benefits that will give you a return?”

Logically organize your data: Fitzpatrick of Rise Analytics says it can pay for companies to collect and store market data even before they are ready to analyze it. “Building that data infrastructure is about two-thirds of the process to getting there with marketing analytics,” he adds.

Start slow: “You don’t have to get all the way to a big data solution and use all this data you have,” says Jacoby of Vail Resorts. “Find the areas that make the most sense, use the information, test and learn, and grow from there.” In late 2012, Vail Resorts had not yet incorporated unstructured data, for example. “Our first step was, ‘Let’s just get


this transactional, structured data in' and now that we have a pretty good foundation of that, we're starting to look at some of the unstructured social data we have," he says.

More on Marketing Analytics

Check out *Data Informed's* Marketing section, where you can find insights on marketing implementations, examples of companies gaining insights and podcast interviews with strategists from the field.

<http://data-informed.com/marketing/>

Strengthen the CMO-CIO relationship: Marketing chiefs may have the money to bypass IT for software as a service analytics (SaaS) products and other resources, but collaborating with IT leaders could produce better results. Marketing data could be integrated with data from other areas of the organization like operations, for example, and customer information could be better protected.

Build the right team: Ideally you'll find staffers who not only have analytical skills, but also an understanding of marketing. Given today's shortage of analytical talent, this goal might rank among your most difficult challenges, but keep at it: These "hybrids" are out there. 

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Companies have always wanted to know what their customers really think. When customers are willing to share views online, sentiment analysis seeks to deliver insights and meaning.

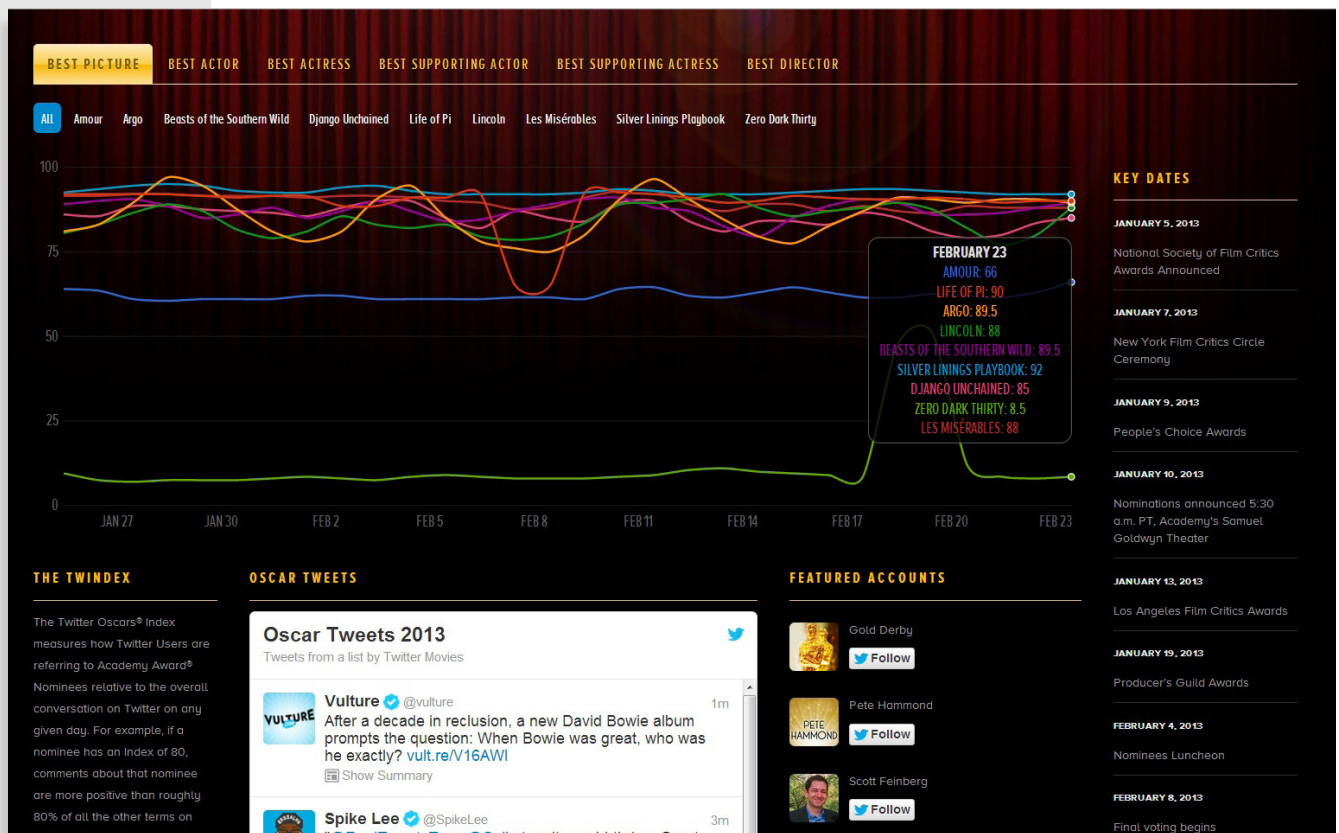
Guide to Sentiment Analysis

By Joe Mullich

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Companies have always wanted to know what their customers really think about their products, services, and their overall brand. Sometimes customers are more than willing to tell them, such as when they vent to service reps at a call center. More and more, however, much of this conversation takes place online on blogs, Facebook, Twitter, and other social media sites.

It's one thing to get a sense of how people feel if you're only reading five blogs or a few tweets. Making sense of thousands and thousands of comments pouring in from all sorts of social media in a timely way is another matter. That's where customer sentiment analysis comes in. This fast-growing branch of technology attempts to turn all those tweets, comments, compliments, and rants into actionable insight.



↑ **Tracking the Oscars:** Social media posts represent fertile ground for sentiment analysis. Above, a detail from the Twitter Oscars Index, tracking user sentiment for best picture award leading up to the ceremony on Feb. 24, 2013. Activity showed a close race before *Argo* won the award.

The Voice of the Customer

For all the attention being directed at customer sentiment analysis, the concept of deriving insight from customers' feelings isn't new. A decade ago, companies like American Honda, Sub-Zero, and Whirlpool analyzed frequently-repeated words in warranty claims and service data, identifying potential problems and taking early action before they became widespread. Leslie Ament, vice president, research and client advisory of the Hypanthia Research Group, considers customer sentiment analysis to be a branch of voice of the customer initiatives.

"Social intelligence

is not root cause analysis. You can tell the reaction to something is positive, negative, or neutral, but you have to **figure out the reason.**"

– Leslie Ament,
Hypanthia Research Group

There are more than 100 social analytics vendors that produce technology to decipher the tsunami of public opinion. Some of these tools analyze only one distinct type of information, such as Twitter and/or Facebook, blogs, RSS feeds, or certain media outlets. The most sophisticated tools, Ament says, have the ability to "drink from the fire hose" and analyze a vast array of online content.

While online comments have drawn the most attention, they aren't the only places that use sentiment analysis. For example, sentiment analysis tools can be applied to the information that comes into a call center. In this case, the tools would analyze email messages or the transcripts of telephone calls.

Use Cases

Currently, customer sentiment analysis is primarily used by marketing departments. However, it can be leveraged for a wide range of purposes. Companies can:

- Identify how people feel about their brand in general.
- Track the impact of marketing efforts.
- Help develop ideas for new products and services.
- Identify public reactions towards specific events, such as product launches and keynote addresses by key executives.
- Determine the probability that a product or service will be purchased.
- Develop early warning systems that identify issues that are bubbling under the surface.
- Understand how the brand/product/service compares to the competition.

"With the advent of social media and the proliferation of reviews, ratings, recommendations, feedback and other forms of online expression, online opinion has turned into a kind of virtual currency for businesses looking to market their products,

identify new opportunities and manage their reputations,” says Venkat Viswanathan, the CEO and founder of LatentView, a data analytics company.

How Sentiment Analysis Works

Customer sentiment analysis is a complex, multi-step process. The various tools work in somewhat different ways. Typically, they rely on natural language processing, which turns text like tweets and blogs into a format that computers can understand. And then artificial intelligence applies algorithms against that data.

A basic task in sentiment analysis is classifying the polarity of a given piece of material, which means determining whether the expressed opinion is positive, negative or neutral. “Now there are beyond-polarity solutions, which look at emotional categories — for instance, angry, happy, sad, frustrated, satisfied,” says analyst Seth Grimes who runs the Sentiment Analysis Symposium.

Customer sentiment is rarely a completely automatic process. Depending on the specific tool, a human analyst may need to set up categories for the type of insight you are trying to find and then train the software on how to classify comments based on the categories.

The information is presented in terms of metrics, trend analysis, and/or key performance indicators on dashboards or data visualization tools.

Why Is It So Hard?

Customer sentiment analysis is an inexact science. Theoretically, the accuracy of customer sentiment analysis is how well it agrees with human judgment. However, a group of humans can read the same piece of material and not agree whether the opinions are positive or negative.

Human speech is difficult to analyze. The software tools might not support every language or dialect. An ironic or sarcastic comment can be misinterpreted. For such reasons, customer sentiment analysis has many false negatives. For example, the word “crying” in a Facebook post might be considered to be a negative comment because the software doesn’t realize the phrase “crying with joy” is enthusiastic praise. A compounding sentiment — “I love my cellphone but hate my carrier” — can be difficult for the software to decode.

Customer sentiment analysis is often said to be successful if it agrees with human thought at least 80 percent of the time, but there are lots of debates on how to best measure it. Grimes says the accuracy level necessarily depends on what business

problem you are trying to solve. "If you are trying to get the mood of people in response to a new marketing campaign or a presidential campaign, you don't need to get into the nitty-gritty," he says. "In the case of counter-terrorism, you want 100 percent accuracy."

There are other potential issues. The comments coming in from, say, Twitter may not be representative of the entire customer base, so a small subset of vocal customers can skew your view of what true public opinion is.


An Invitation to More Customer Research

Even when customer opinion is accurately measured, that information doesn't explain why the customer feels that way. "Social intelligence is not root cause analysis," Ament says. "You can tell the reaction to something is positive, negative, or neutral, but you have to figure out the reason. It tends to be high-level trending information."

More on Sentiment Analysis

Data Informed has more online about companies gauging customer sentiment and the opportunities and challenges involved in deploying analytics for social media.

<http://data-informed.com/tag/social-media/>

For these reasons, sentiment analysis is usually a starting point that requires a company to dig deeper. For example, if an analysis shows that 11 percent of posts mention the word "problem" in conjunction with your product, that should be a warning to investigate. Usually the results from customer sentiment analysis have to be carefully studied, and sometimes merged with data from other sources, such as customer data, to understand what the "problem" might be. 

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